

WHAT IS CLAIMED IS:

1. A method for controlling operation of a gas turbine engine using a rotor protection system to prevent a rotor from operating at a speed greater than a pre-set operational maximum speed, the engine including a fuel metering system including a fuel metering valve and a fuel bypass valve, the rotor protection system including a servovalve coupled to the fuel metering system and a fuel bypass valve, said method comprising the steps of:

supplying fuel to the engine through the fuel metering valve and the fuel shutoff valve; and

controlling fuel flow to the engine with the servovalve if the fuel metering valve becomes inoperable.

2. A method in accordance with Claim 1 wherein the engine includes a low pressure drain in flow communication with the fuel metering system, said step of controlling fuel flow further comprising the step of diverting a portion of the fuel flowing to the metering valve through the fuel bypass valve when an overspeed condition is detected.

3. A method in accordance with Claim 1 wherein the engine further includes a low pressure drain and a restrictor orifice in flow communication with the fuel metering system, said step of controlling fuel flow further comprises the step of opening the fuel bypass valve such that a portion of the fuel flowing from the metering valve is diverted through the fuel bypass valve.

4. A method in accordance with Claim 1 wherein said step of controlling fuel flow further comprises the step of controlling fuel flow to the engine with the servovalve independently of the fuel metering valve.

5. A method in accordance with Claim 1 wherein the engine further includes a shutoff solenoid valve coupled to the servovalve, said step of controlling

fuel flow further comprises the step of stopping fuel flow to the engine with the shutoff solenoid valve.

6. A rotor overspeed protection system for a gas turbine engine comprising:

5 a fuel metering system comprising a fuel metering valve; and

a servovalve coupled to said fuel metering system and configured to control fuel flow to the engine if said fuel metering valve becomes inoperable.

7. A rotor overspeed protection system in accordance with Claim 6 wherein said fuel metering system further comprises a fuel shutoff valve and a fuel
10 bypass valve in flow communication with said fuel metering valve.

8. A rotor overspeed protection system in accordance with Claim 7 wherein said servovalve further configured to divert a portion of fuel flowing from said fuel metering valve to a low pressure drain in flow communication with said fuel bypass valve.

15 9. A rotor overspeed protection system in accordance with Claim 7 wherein said servovalve further configured to divert a portion of fuel flowing from said fuel metering valve through a restricting orifice to a low pressure drain such that additional fuel is diverted through said fuel bypass valve.

20 10. A rotor overspeed protection system in accordance with Claim 6 wherein said servovalve further configured to control metered fuel flow to the engine independently of said fuel metering valve.

11. A rotor overspeed protection system in accordance with Claim 6 wherein said servovalve further configured to stop fuel flow to the engine.

25 12. A rotor overspeed protection system in accordance with Claim 6 further comprising a shutoff solenoid valve coupled to said servovalve and configured to stop fuel flow to the engine.

13. A gas turbine engine comprising:

a fuel metering system comprising a fuel metering valve, said fuel metering system configured to supply fuel to said engine; and

5 a servovalve coupled to said fuel metering system and configured to control fuel flow to said engine if said metering valve becomes inoperable.

14. A gas turbine engine in accordance with Claim 13 wherein said servovalve further configured to control fuel flow to said engine independently of said fuel metering system.

10 15. A gas turbine engine in accordance with Claim 13 wherein said servovalve further configured to stop fuel flow to said engine.

16. A gas turbine engine in accordance with Claim 13 further comprising a shutoff solenoid valve coupled to said servovalve and configured to stop fuel flow to said engine.

15 17. A gas turbine engine in accordance with Claim 13 further comprising restricting orifice coupled to said servovalve in flow communication with said fuel metering valve.

18. A gas turbine engine in accordance with Claim 17 wherein said servovalve configured to divert a portion of fuel flow exiting said fuel metering valve through said restricting orifice.

20 19. A gas turbine engine in accordance with Claim 17 further comprising a low pressure drain in flow communication with said fuel metering system, said servovalve configured to divert a portion of fuel flow exiting said fuel metering valve to said low pressure drain.